



(43) International Publication Date
4 November 2004 (04.11.2004)

PCT

(10) International Publication Number
WO 2004/095111 A3

(51) International Patent Classification⁷: **G02B 26/08**,
26/10, B81B 3/00

Street, 34558 Haifa (IL). ZIMMERMAN, Yaron [IL/IL];
8 Borochoy Street, 36046 Kiryat Tivon (IL).

(21) International Application Number:
PCT/IL2004/000336

(74) Agent: **KORAKH**, Eliav; Borochoy, Korakh, Eliezri &
Co., P.O. Box 58100, Kiryat Atidim, 61580 Tel Aviv (IL).

(22) International Filing Date: 20 April 2004 (20.04.2004)

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/464,444 21 April 2003 (21.04.2003) US

(71) Applicants (for all designated States except US): **ELOP
ELECTRO-OPTICS INDUSTRIES LTD.** [IL/IL];
P.O. Box 1165, Kiryat Weizmann, 76111 Rehovot (IL).
**TECHNION RESEARCH AND DEVELOPMENT
FOUNDATION LTD.** [IL/IL]; Technion City, 32000
Haifa (IL).

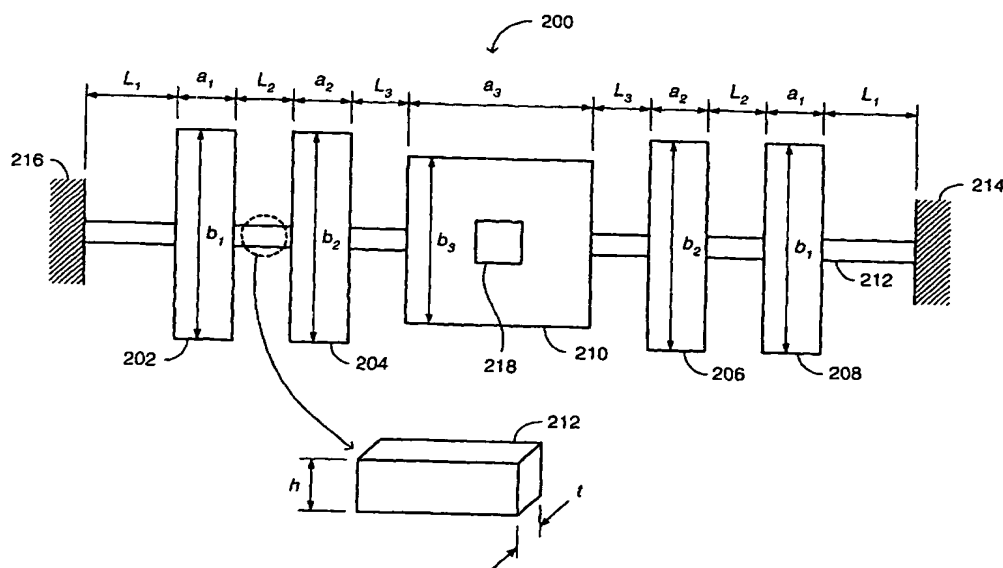
(72) Inventors; and

(75) Inventors/Applicants (for US only): **VELGER**,
Mordechai [IL/IL]; 22 Shin Bet-Zion Street, 76465
Rehovot (IL). **BUCHER**, Itzhak [IL/IL]; 28 Palmach

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: OSCILLATING MIRROR HAVING A PLURALITY OF EIGENMODES



(57) Abstract: Oscillating mirror system (200) including a plurality of masses (202, 204, 210, 206, 208), at least one force producing element (218), and a plurality of elastic elements (212), each of the force producing elements (218) being coupled with a respective one of the masses, at least one of the masses (210) including a mirror (210), each of the force producing elements (218) applying a force to the masses, the elastic elements (212) coupling the masses (202, 204, 210, 206, 208) together, the elastic elements (212) coupling the masses with a respective support (214, 216), wherein the mass values of the masses, the force values of the forces, and the stiffness coefficients of the elastic elements, are selected such that the mirror periodically according to the eigenfrequencies of the oscillating mirror system (200).



Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:

16 December 2004

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IL2004/000336

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G02B26/08 G02B26/10 B81B3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G02B B81B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 197 28 598 A (BOSCH GMBH ROBERT) 4 February 1999 (1999-02-04) column 3, line 5 - line 20 column 4, line 39 - column 5, line 66; figure 1	1-18
X	DE 101 19 073 A (SCHNEIDER LASER TECHNOLOGIES A) 5 December 2002 (2002-12-05) paragraphs '0050! - '0054! figures 1,2	1-18
X	US 2001/055146 A1 (ATOBE MITSURO ET AL) 27 December 2001 (2001-12-27) paragraphs '0146! - '0148! paragraphs '0154!, '0155! figures 1,2	1-18
	----- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

29 September 2004

Date of mailing of the international search report

13/10/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

von Hentig, R

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IL2004/000336

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/44571 A (XROS INC) 8 October 1998 (1998-10-08) page 19, line 5 - line 31 figure 13 -----	1-18
A	LUCENTE, M; ST. HILAIRE, P; BENTON, S; ARIAS, D.L.; WATLINGTON, J.A.: "New Approaches to Holographic Video" SPIE PROCEEDINGS OF HOLOGRAPHICS INTERNATIONAL '92, vol. 1732, July 1992 (1992-07), pages 377-386, XP002298455 BELLINGHAM, WA page 384, paragraph 3 - paragraph 5 -----	1-4
A	US 4 958 894 A (KHOWLES CARL H) 25 September 1990 (1990-09-25) column 2, line 34 - line 40 figure 4 -----	1-3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IL2004/000336

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 19728598	A	04-02-1999	DE 19728598 A1	04-02-1999
DE 10119073	A	05-12-2002	DE 10119073 A1	05-12-2002
			WO 02099504 A2	12-12-2002
			EP 1421429 A2	26-05-2004
			US 2004130765 A1	08-07-2004
US 2001055146	A1	27-12-2001	JP 9159937 A	20-06-1997
			JP 9236762 A	09-09-1997
			US 6271955 B1	07-08-2001
			US 6107115 A	22-08-2000
			US 2003016435 A1	23-01-2003
			US 5999306 A	07-12-1999
WO 9844571	A	08-10-1998	EP 1012890 A1	28-06-2000
			JP 2001519726 T	23-10-2001
			US 5969465 A	19-10-1999
			WO 9844571 A1	08-10-1998
US 4958894	A	25-09-1990	WO 9008363 A1	26-07-1990